are provided in the Appendix. It also lists names and addresses of manufacturers and suppliers of specialised chemicals and equipment used in liposomology, together with a list of important publications on the application of liposomes.

The layout of the book and chapters therein is well done, the index is thorough and the illustrations and diagrams are good. It is good value for money and I recommend that my colleagues keep this book in their laboratory.

H.M. Patel

Modern physical methods in biochemistry, Volume 11B; Edited by A. Neuberger and L.L.M. van Deenen Elsevier; Amsterdam, New York, Oxford, 1988 xi + 308 pages; $94.25

Compiling a volume of methods can be a daunting task and writing the contributions yet more difficult. The choice of 'methods' to be included is always subjective and this volume is the second in a two volume contribution to the 'New Comprehensive Biochemistry' series from Elsevier. Volume 11A covers protein crystallography, NMR, ESR, mass spectroscopy, circular dichroism and optical rotary dispersion. With the 'heavy weights' and well established methods dealt with, it is easy to make volume 11B almost an after-thought. A cursory glance at the chapter titles might lead one to suppose this is close to being true, but the choice made by the editors is an interesting, if not indeed an informed and, in some cases, very useful one.

The contributor's difficulty is whether to write a 'how to do it' chapter or a 'review of the latest work' chapter. Here, the editors have made their intentions clear; no 'how to do it' with nuts and bolts detail chapters are in this volume. Reviews do appear, unfortunately, but some authors tread the line skilfully. The format of each chapter is different, with everything from a 'theory, instrument, results' approach to one chapter being essentially an historical ramble through the method.

A failure with such volumes, which many contributors worry about when writing, is the tardiness of appearance on the shelves of this kind of compilation. One author admits to references being included up to mid-1986. However, three authors include just a single paragraph in their chapter, essentially saying that the newest development of the method has shown a specific improvement, with a list of systems studied but no further details or information. Adjunct paragraphs like this suggest addition in the proof stage, but surely if this is the 'newest, latest and best' about the method, should the development not get a major discussion? If there is one criticism of the editorial aspect of this volume, this is it. New developments should have been expanded and made more prominent, not appearing as after-thoughts.

Chromatography today is surely one of the poor cousins of biochemistry. Although vital to virtually every aspect of modern molecular science, what funding body would give more than modest support for a project to improve or develop new chromatographic methods? Despite being the territory of industry nowadays perhaps, two chapters in this volume are dedicated to the method. Colpan and Riesner give a short, but fact-filled contribution on high performance liquid chromatography of nucleic acids. With a modern day need for routine chromatography of nucleic acids in various stages in cloning and sequencing procedures, production of DNA fragments and plasmids, as well as in diagnostic applications for medicine, phytopathology and testing genetic disorders and infectious disorders, this chapter is certainly a valuable contribution. Sufficient technical information is provided along with general hints for extension to new applications. What is missing, the general principles of chromatography, is found in Hearn and Aguilar's contribution on the chromatography of peptides and proteins. Ways of predicting chromatographic properties are presented, and even suggestions about how secondary structural considerations may affect elution properties, even though it is quite unclear whether such structural features observed in elution solvents are still maintained during chromatography itself. The new and pressing need to deal with hydrophobic membrane associating peptides is also systematically and informatively covered. If there is a criticism of these two chapters in particular, if not others, it is that no indication of potential problems are given; one has the feeling that only the best results are presented with no indication about the hard effort expended to achieve such 'textbook' results.

The lack of organization in chapter 1 gives the reader the impression that the author, Lakowicz, is an exceptionally well established expert who is entirely immersed in Fluorescence spectroscopy and its application to biological systems, but that to communicate this knowledge does not come easily. Most annoying and distracting is the continual oscillation between technical aspects, review of results and theory, with little coherence. This chapter is certainly not instructive, but could be the transcript of a detailed conversation between established experts. Poor proof reading contributes further to the distraction; Figure 3 is frequently referred to when Figure 2 should have been referenced, figure legends are often less than informative (Figure 18 and the curve fitting routine, for example), and reference to 'the data for nuclease...' with no indication about how or where it originated, are typical examples of irritations encountered. In addition, this is one of the chapters which mentions the latest developments (pulse laser instruments) but devotes no more than a short paragraph to this new development and list of applications with no attempt at informing the reader further about 'modern methods'.

In sharp contrast, 'Raman and resonance Raman' by Carey and 'X-ray and neutron scattering' by Perkins, take the reader from a similar base-line in assuming a modicum of biophysical knowledge, to a high level of appreciation of the methods with an exceptionally clear pedagogical style which nurtures the reader to a position of confidence and familiarity with the techniques; both chapters would make excellent undergraduate or postgraduate teaching texts. Carey explains basic principles and leads the reader convincingly up the

classical garden path, meeting smoothly and not disjointedly with the quantum mechanical explanation for spectroscopy. Following the presentation of the theory, the experimental aspects and then the results, makes for a very clear chapter, with useful tables of results from Raman studies on intrinsic chromophores. One omission is a 'conclusion' or 'future directions' section, with an attempt at indicating how the method may develop.

The saving grace of the volume must surely be the chapter from Perkins on X-ray and neutron scattering. Again a conventional 'theory, instrument, applications' approach is used with great effectiveness. A list of 566 references must make this one of the most comprehensive review chapters on a method ever written. New approaches are described well, especially the specific labelling of biomolecules with deuterons for spatial triangulation studies by neutron scattering, which is a most powerful and important adjunct to, for example, membrane protein studies. The author's enthusiasm for the method is evident, although surprisingly the difficulties and infrequency in securing sufficient instrument time, a common complaint of experimenters, does not emerge. More on the potential of spallation methods would have been appreciated (little data is, as yet, available though), since this will enable molecular dynamics to be described in non-model dependent ways for biomolecules. Putting this minor criticism to one side, the volume is almost worth buying for this one chapter alone.

The chapter from Gibson, is 'an arbitrary section... influenced by personal bias' and describes an historical journey through technical improvements of the method and attempts to improve time-resolution for following reactions in biochemistry and chemistry. Since several Nobel prizes have been awarded for improvements and innovations in this area, the chapter is surprisingly blasé about the achievements and contributions to the field. The pessimistic attitude of this chapter would discourage anyone from attempting to work in the area. Comments that 'there have been so many investigations as to defy review, and so diverse as to defeat generalisation', gives the reader a feeling of utter bewilderment; what have we learnt and why bother? Personal, unjustified bias perhaps, but diagrams, tables and figures *do* help in scientific reviews and save on words; this chapter, peculiarly, is entirely text.

Electron microscopy, especially with support from image reconstruction and analysis methods to give molecular information, is now becoming a powerful addition to other biophysical methods and gaining much more respect than just a 'look-see' approach. Unfortunately, no real mention of the newest developments are included in the chapter from Voorhout and Verkleij. The bias to membrane systems is perhaps understandable from the authors' own experience, but some indication of electron diffraction methods or image reconstruction methods would have brought the technique up to date. Even deep-etch methods are discussed without an example or micrograph being shown, and no 2-D arrays of any membrane proteins are shown. An excess of non-bilayer lipid structures is shown, but this has been done so often now; the volume does, after all, suggest 'modern physical methods' and they should be included.

As a final note, Elsevier still produce superb books, which always have a nice and solid feel. The micrographs are beautifully reproduced and the proof reading (except in Chapter 1) and typographical faithfulness are of highest quality. The four high quality chapters in this volume make it worthy of addition to any library or laboratory and, together with a 'how to do it' book, would form a good base from which a researcher could embark upon an unfamiliar method in the study of biomolecules of interest.

Anthony Watts

Chambers Biology Dictionary; Edited by P.M.B. Walker; W. & R. Chambers and Cambridge University Press; Cambridge, 1989; xii + 324 pages; £8.95 (soft cover)

Concise Encyclopedia Biochemistry (Second edition); By Thomas Scott and Mary Eagleson; Walter de Gruyter; Berlin, New York, 1988; 649 pages; $89.90

Dictionary of Microbiology and Molecular Biology; By P. Singleton and D. Sainsbury; Wiley-Interscience; Chichester, 1988; xii + 1019 pages; £69.00

Dictionaries of scientific terms fulfil a useful reference function, especially at the present time when advances in many subjects are so rapid that it is it difficult to keep abreast of new technologies.

The **Chambers Biology Dictionary** is stated to cover the following subjects: Animal behaviour, biochemistry, cell biology, ecology, ethology, forestry, genetics, immunology, microscopy, molecular biology, radiology, statistics and zoology. Inevitably in a work attempting to cover such a broad range of subjects there are bound to be gaps but quick perusal suggests that the areas of biochemistry and molecular biology are less well represented than one would have expected. For example, proteins are dealt with in only half a page, ribosomes in five lines and protein biosynthesis not at all. I also detected (without spending much time) omissions such as activation of amino acids, aminoacyl adenylate, alpha helix, informosome, active site (although this last term is included under 'allosteric site'). Similarly, apoenzyme is not mentioned as such, although apoprotein is. In the latter entry, 'conjugated protein' is used but not defined. Occasionally,